TRANSMITTAL
FORM

(for all correspondence after initial filing)

Attorney Docket No. **MBA-101**	Total Pages
Application Number **09/847,513**	
Filing Date **5/1/2001**	
First Named Inventor **EDWARD F. DELONG**	
Group Art Unit **1645**	
Examiner **NOT ASSIGNED**	

ENCLOSURES (check all that apply)

[X] Return Receipt Postcard (MPEP 503)

[ ] Fee Transmittal Form

    [ ] Fee Attached

[X] Response/Amendment

    [X] Reply under 37 CFR 1.111 with mark up version and clean version

    [X] Statement to computer disk and sequence listing

    [X] Corrected sequence listing   Total Sheets: [235]

    [X] Disk of corrected sequence listing

[ ] Extension of Time Request

[ ] Express Abandonment Request

[ ] Response to Notice of Missing Parts

[ ] Small Entity Statement

[ ] Declaration by Inventors

[ ] Assignment papers

    [ ] Power of Attorney by Assignee

[ ] IDS/PTO-1449

    [ ] with copies of cited references

[ ] New Power of Attorney and Revocation of Old

    [ ] Change of Correspondence Address

[ ] Other:

SIGNATURE OF AGENT

NAME	MAREK ALBOSZTA, REG. NO. 39,894
Signature	
Date	6 Aug. 2001

Certificate of Mailing by "Regular Mail"

I hereby certify that this correspondence is being deposited on the date indicated below as first class mail with the U.S. Postal Service addressed to the ASSISTANT COMMISSIONER FOR PATENTS, WASHINGTON, DC 20231.

SIGNATURE
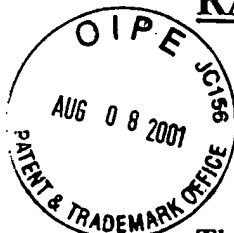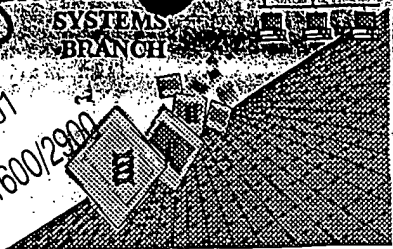
DATE OF MAILING:

8/6/01

NAME OF PERSON SIGNING
Monica Turner

RAW SEQUENCE LISTING
ERROR REPORT

The Biotechnology Systems Branch of the Scientific and Technical Information Center (STIC) detected errors when processing the following computer readable form:

Application Serial Number: _09/847,573_

Source: _OIPE_

Date Processed by STIC: _5/16/2001_

THE ATTACHED PRINTOUT EXPLAINS DETECTED ERRORS.
PLEASE FORWARD THIS INFORMATION TO THE APPLICANT BY EITHER:
1) INCLUDING A COPY OF THIS PRINTOUT IN YOUR NEXT COMMUNICATION TO THE APPLICANT, WITH A NOTICE TO COMPLY or,
2) TELEPHONING APPLICANT AND FAXING A COPY OF THIS PRINTOUT, WITH A NOTICE TO COMPLY
FOR CRF SUBMISSION QUESTIONS, PLEASE CONTACT MARK SPENCER, 703-308-4212.

FOR SEQUENCE RULES INTERPRETATION, PLEASE CONTACT ROBERT WAX, 703-308-4216.
 PATENTIN 2.1 e-mail help: patin21help@uspto.gov or phone 703-306-4119 (R. Wax)
 PATENTIN 3.0 e-mail help: patin3help@uspto.gov or phone 703-306-4119 (R. Wax)

TO REDUCE ERRORED SEQUENCE LISTINGS, PLEASE USE THE CHECKER VERSION 3.0 PROGRAM, ACCESSIBLE THROUGH THE U.S. PATENT AND TRADEMARK OFFICE WEBSITE. SEE BELOW:

Checker Version 3.0

The Checker Version 3.0 application is a state-of the-art Windows based software program employing a logical and intuitive user-interface to check whether a sequence listing is in compliance with format and content rules. Checker Version 3.0 works for sequence listings generated for the original version of 37 CFR §§1.821 – 1.825 effective October 1, 1990 (old rules) and the revised version (new rules) effective July 1, 1998 as well as World Intellectual Property Organization (WIPO) Standard ST.25.
Checker Version 3.0 replaces the previous DOS-based version of Checker and is Y2K-compliant. Checker allows public users to check sequence listings in Computer Readable form (CRF) before submitting them to the United States Patent and Trademark Office (USPTO). Use of Checker prior to filing the sequence listing is expected to result in fewer errored sequence listings, thus saving time and money.

Checker Version 3.0 can be downloaded from the USPTO website at the following address:
http://www.uspto.gov/web/offices/pac/checker
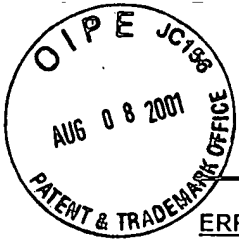
Raw Sequence Listing Error Summary

ERROR DETECTED   **SUGGESTED CORRECTION**   SERIAL NUMBER: 09/847,573

ATTN: NEW RULES CASES: PLEASE DISREGARD ENGLISH "ALPHA" HEADERS, WHICH WERE INSERTED BY PTO SOFTWARE

1 _____ Wrapped Nucleics
The number/text at the end of each line "wrapped" down to the next line.
This may occur if your file was retrieved in a word processor after creating it.
Please adjust your right margin to .3, as this will prevent "wrapping".

2 _____ Wrapped Aminos
The amino acid number/text at the end of each line "wrapped " down to the next line.
This may occur if your file was retrieved in a word processor after creating it.
Please adjust your right margin to .3, as this will prevent "wrapping".

3 _____ Incorrect Line Length
The rules require that a line not exceed 72 characters in length. This includes spaces.

4 _____ Misaligned Amino Acid Numbering
The numbering under each 5th amino acid is misaligned. This may be caused by the use of tabs
between the numbering. It is recommended to delete any tabs and use spacing between the numbers.

5 _____ Non-ASCII
This file was not saved in ASCII (DOS) text, as required by the Sequence Rules.
Please ensure your subsequent submission is saved in ASCII text so that it can be processed.

6 _____ Variable Length
Sequence(s) _____ contain n's or Xaa's which represented more than one residue.
As per the rules, each n or Xaa can only represent a single residue.
Please present the maximum number of each residue having variable length and
indicate in the (ix) feature section that some may be missing.

7 _____ PatentIn ver. 2.0 "bug"
A "bug" in PatentIn version 2.0 has caused the <220>-<223> section to be missing from amino acid
sequence(s) _____ _____. Normally, PatentIn would automatically generate this section from the
previously coded nucleic acid sequence. Please manually copy the relevant <220>-<223> section
to the subsequent amino acid sequence. **This applies primarily to the mandatory <220>-<223>**
sections for Artificial or Unknown sequences.

8 _____ Skipped Sequences (OLD RULES)
Sequence(s) _____ missing. If intentional, please use the following format for each skipped sequence:
(2) INFORMATION FOR SEQ ID NO:X:
(i) SEQUENCE CHARACTERISTICS:(Do not insert any headings under "SEQUENCE CHARACTERISTICS")
(xi) SEQUENCE DESCRIPTION:SEQ ID NO:X:
This sequence is intentionally skipped

Please also adjust the "(iii) NUMBER OF SEQUENCES:" response to include the skipped sequence(s).

9 _____ Skipped Sequences (NEW RULES)
Sequence(s) _____ missing. If intentional, please use the following format for each skipped sequence.
<210> sequence id number
<400> sequence id number
000

10 _____ Use of n's or Xaa's (NEW RULES)
Use of n's and/or Xaa's have been detected in the Sequence Listing.
Use of <220> to <223> is MANDATORY if n's or Xaa's are present.
In <220> to <223> section, please explain location of n or Xaa, and which residue n or Xaa represents.

11 _____ Use of "Artificial" (NEW RULES)
Use of "Artificial" only as "<213> Organism" response is incomplete, per 1.823(b) of New Sequence Rules.
Valid response is Artificial Sequence.

12 _____ Use of <220>Feature (NEW RULES)
Sequence(s) _____ are missing the <220>Feature and associated headings.
Use of <220> to <223> is MANDATORY if <213>ORGANISM is "Artificial Sequence" or "Unknown"
Please explain source of genetic material in <220> to <223> section.
(See "Federal Register," 6/01/98, Vol. 63, No. 104, pp. 29631-32)   (Sec. 1.823 of new Rules)

13 _____ PatentIn ver. 2.0 "bug"
Please do not use "Copy to Disk" function of PatentIn version 2.0. This causes a corrupted
file, resulting in missing mandatory numeric identifiers and responses (as indicated on raw sequence listing).
Instead, please use "File Manager" or any other means to copy file to floppy disk.

AMC - Biotechnology Systems Branch - 4/06/2001

OIPE

RAW SEQUENCE LISTING   DATE: 05/16/2001
PATENT APPLICATION: US/09/847,513   TIME: 13:37:02

Input Set : A:\MBA10101.txt
Output Set: N:\CRF3\05162001\I847513.raw

Does Not Comply
Corrected Diskette Needed

PP 2-16

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 3 <110> APPLICANT: MBARI
 4        DeLong, Edward
 5        Beja, Oded
 7 <120> TITLE OF INVENTION: Light-driven energy generation using proteorhodopsin
 9 <130> FILE REFERENCE: MBA-101
11 <140> CURRENT APPLICATION NUMBER: US/09/847,513
11 <141> CURRENT FILING DATE: 2001-05-01
11 <150> PRIOR APPLICATION NUMBER: 60/201,602
12 <151> PRIOR FILING DATE: 2000-05-03
14 <160> NUMBER OF SEQ ID NOS: 65
16 <170> SOFTWARE: PatentIn version 3.0
18 <210> SEQ ID NO: 1
19 <211> LENGTH: 105184
20 <212> TYPE: DNA
21 <213> ORGANISM: Naturally occurring gamma proteobacterium
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24 <221> NAME/KEY: CDS(complement)
25 <222> LOCATION: (50866)..(51615)
26 <223> OTHER INFORMATION: light-driven proton pump; has the properties of a light-driven pr
27        oton pump when expressed with retinal in Escherichia col
30 <300> PUBLICATION INFORMATION:
31 <301> AUTHORs: Beja,O., Aravind,L., Koonin,E.V., Suzuki,M.T., Hadd,A.,Nguyen,L.P.,
32        Jovanovich,S.B., Gates,C.M., Feldman,R.A., DeLong,E.F
33 <302> TITLE: Bacterial rhodopsin: evidence for a new type of phototrophy in the sea
34 <303> JOURNAL: Science
35 <304> VOLUME: 289
36 <305> ISSUE: 5486
37 <306> PAGES: 1902-1906
38 <307> DATE: 2000-09-15
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40 <309> DATABASE ENTRY DATE: 2000-06-15
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PATENT APPLICATION: US/09/847,513   TIME: 13:37:02

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RAW SEQUENCE LISTING   DATE: 05/16/2001
PATENT APPLICATION: US/09/847,513   TIME: 13:37:02

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RAW SEQUENCE LISTING   DATE: 05/16/2001
PATENT APPLICATION: US/09/847,513   TIME: 13:37:02

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Output Set: N:\CRF3\05162001\I847513.raw

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306 ataagaacag tcactctcaa tgagcattct atgcaaatgc taaaaaatat tggtatttgc  7920
308 ccatcaattg ctcaaatcaa cagcatcgac gtattagatg gtgagggtac aggcaaaatt  7980
310 caatttctag caaaggacgt aggcagcgaa aaccttcat atgtaaccta tttcaatgaa  8040
312 ttacaaaaac taatttctga tccatgtaaa gaaagaacct tatttaataa tgagattgat  8100
314 tcagttcaga atcttaatac agaatctgat ccagagatca tgcttaaaga tggcatgacc  8160
316 ataaaaacga atctaattgc tggatgtgat ggaagaaatt caaatattgc aaaaattgct  8220
318 tcacttacaa gcagcttcga tgactactta caaacagctt taacttttgt cgttgatatt  8280
320 gataatgatt cacatggcaa agctcaccaa gttttttctg aaaaaggaat atttgcactt  8340
322 atgccactcc cagaaggcaa gggtgagatg aataaatgca cagtggtttg gtcaataaaa  8400
324 aatcaagttt tgggagatga gcctgtatct gagtttgtaa aaataacat ttctttttt  8460
326 gaatcaaagc ttaatgttag tctcagggtt aagtcagaaa ttttaagttt taaattatcg  8520
328 aaccatcatt ttgaaaacta tattagcgga cctattgttc ttcttggtga tgctgctcac  8580
330 tcaattcacc ccttagcagg tcaaggtatt aatctaggat ttgcagatgc agatactttt  8640
332 tgtgaagagg taattagttc ttataaaaaa gggattgcct ttaatgagaa atcagtttta  8700
334 aaaagatatg agattagaag aaaaagtatg aactttttaa tgttgaagtc tatggacttt  8760
336 tttgttggatt tatttggttc agaacattta tatctaaggc tgatcagaaa tttaggtatt  8820
338 tcttcgttaa ataaatcaaa gttgttaaa gcattcttta taagacatgc ctctggaatg  8880
340 aataagtttt aaatttgtat taaacttttt gacctttagc tctaagttct ttaagaactt  8940
342 cactaatgcc tttttatca atgattctca taccttttgc agatacttta agatttacga  9000
344 acctgttctc agattcaacc caaaatttgt gtgtgtgaag attaggaaaa aactttcttt  9060
346 tagtcctatt tttagcgtga gaaacattgt ttcctgactg tggtatctta cctgttactt  9120
348 gacatatttt actcattgaa acgcgatttt atagaacact gaggaactta gcaatactat  9180
350 tgtgaaacaa atttatttat tacggcatgc acaatctgac tggagagct ctaatcagaa  9240
352 agattttgat agaccattag caagaaaagg cattgaagaa gcaaataaaa tatcatgtta  9300
354 ctgcaaatct cattcaattt tagtagataa aatattctgt agcactgcag aaagaactaa  9360
356 gcagacttt gatatatgca gtgatgggct taattatcca atagctgaag cagtctatac  9420
358 tgatgagctt tacttttctg gccctggtga gatcgttaag cttatccaaa gtttaagtga  9480
360 attcatttcc tctgttttaa taataggcca caatccatca atgcaaatgt acatagatgc  9540
362 tatttcagaa aatcctcata ttacgtattc aacatgcggg ctggcagaaa ttctcgttga  9600
364 aagttcatgg aaagacttat ctttaaaaaa atgtaagtta aaatcttta ttcaaccagg  9660
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RAW SEQUENCE LISTING   DATE: 05/16/2001
PATENT APPLICATION: US/09/847,513   TIME: 13:37:02

Input Set : A:\MBA10101.txt
Output Set: N:\CRF3\05162001\I847513.raw

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366 agagctttaa aaattgaaaa acataaaaat taagatcatt aacccactaa tgggatccaa  9720
368 gataccctta cctcaatatg aaacaaaggg ctcggcagga ttggatttaa gggcatgcct  9780
370 agatagtaat ctcagccttc aagcaggaac atctcagttg atacctattg gttttgcaat  9840
372 gtacttagaa gatcccggtc ttgcagcaat ggttatacct agatcaggtt taggttctaa  9900
374 gcatggaatc gttcttggta atctggttgg gttgattgat tcagactatc aaggagagct  9960
376 aatggttcct gcctggaata gatcagatac agattttgag attaatcctg gagacaggat 10020
378 tgcacaaatg attatagttc cagtgattca agcagattt gaaattgtag acgagttcaa 10080
380 tgagactcag aggggagaaa agggtttttgg aagttcaggt ataaattgat aaatttactt 10140
382 tttcttgcca aatctttctt caaatttctg aactcttccg ccagtatcaa taattttttg 10200
384 cttaccggta taaaaaggat gagaagcaga ggatatatca agagggtagt atgggtatgt 10260
386 ttttccatct tcccattctt tcgtttgagt cgtatctaat gttgaacgaa tgagaaagaa 10320
388 cttatcagca ctagcgtcat ggaataaaac ttcacggtat tcaggatgta tatcttttt 10380
390 cataataaaa tcaaaatttg gatgagaact ataacaaaaa acaacttctt ttcaatcaaa 10440
392 acatgaaaat ttttactat gacatagctg tttcattgcc tctaaggcaa tgctttactt 10500
394 atagttctga gcttaaaatt acaaaaggaa cccgcgtgtc agttcctttt ggtaaaagga 10560
396 agattgtagg agtggttata aaaaatattc aaaagccaga tttcctaaaa aaagcgggag 10620
398 ctataaaaaa aattatcgct gtacttgatg aatatccttt gttcgacaag ccaattttg 10680
400 attctatatt gtggtcttct gattactatc atcatcctat tggtgaggtt tttaatacct 10740
402 ttatacccac cgaattaaga aaaattaata ataaaaaat tgaagcttta agagaatttt 10800
404 ctgaatattc agtaaatgag gatgataaga aattcgattt aaccaaggat caagaaaaag 10860
406 cagtcaaggc gctttctaaa tctaaaggat tttcacccac tttattatat ggagttacag 10920
408 ggtctggaaa aacagaagtt tacttaagag ttgccgaaac ttttattaaa aataataagt 10980
410 cagtattagt tttagttcca gaaataaatt taaccccca attgctctcg cgatttgaga 11040
412 atagatttaa tggtgaaatt ggcatatatc attctaagca aacagcagct aagagattaa 11100
414 agacttggct aaaaagctaaa tttggttcta taaaaataat agtaggaact cgatcttcgg 11160
416 ctttagtgcc tttagataac attggtttaa taattatcga tgaagagcat gaccaatcat 11220
418 ttaggcagtc agaaggggttt aaattctctg ctagagactt aagtataaaa agggcacagc 11280
420 ttgcagatat tccaattatt ttgggatcag caacccctc gctgcaaact ttaaaacttg 11340
422 taaaagaaaa taaatttata agagttgata ttcctaatcg agttgatgga aacaagcctc 11400
424 ctaaattaat agccttagat atcaataaca gcccttttaat aggcggagtt gctaaagaga 11460
426 caattgaagc aatgcaatca accatagaca gaggagaaca ggttctagtt tttattaata 11520
428 gacgaggatt cgctccactc tatcaatgta gtagttgtgg gtgggtagca gattgtaaat 11580
430 cttgtgatac aaatttagtc ttccaccagg caagaaatag attaatttgt cataggtgtg 11640
432 aatctgccta ctctgttaat ttgtcttgtc cggcatgcaa gtctaatgac tttaatatgt 11700
434 atggagctgg aacagagaga gttgaagaag ttcttaaaag cagctttgta aagactccaa 11760
436 taattagagt tgatcatgac tcaacaaaaa aagtgggagc tatggaggct atagttaaaa 11820
438 aaattcattc ctcagacgca gcaatttttag ttggaactca aatgcttgca aaaggacatg 11880
440 attttcctaa agtcaccttta agcgttattt taaatgctga taatggcctt ataagcccag 11940
442 aaattaatgc attagagaaa atatctcaat tgcttattca ggtctctgca agagcaggaa 12000
444 gaaataataa tcttgcaaaa gttattattc aaacaagata tcctgatgat ataaatctta 12060
446 ataaaattaa gacaggagat tatatgaaat ttgcttctca atgcctaagt accaatgagc 12120
448 aaatgaactt acctccattt actactttat gtctgcttag gtactcatca ccaactcaaa 12180
450 ajagtaatgt agatttccta gagaaagctg ttttaatttt atccaatagg actgatataa 12240
452 atgttattgg tcccttgcct tcattagttt cgaagtcgaa aggaaattat aggcaccaag 12300
454 tctatatcca tgcaccaaag aagacttttt taaataaggt attaaagttt ttgacaacag 12360
456 agtttgaaaa atggccggaa tctaataagg ttaagtggtc tttcgacatt gatccaatag 12420
458 acttaagcta aatattaatc ttaattaatt gtcctgggta tattggttta ttgtttagtt 12480
460 tattctctgt attaatttct tctacagtca ccccaaatct tatcgctatt tctgataaga 12540
462 catccccttt ttgtattttg taagtcacaa agcctggatc aatactcata aaggtatttg 12600
```

```
<210>   4
<211>   750
<212>   DNA
<213>   Naturally occurring gamma proteobacterium

<220>
<221>   CDS
<222>   (1)..(750)
<223>   light-driven proton pump; has the properties of a light-driven pr
        oton pump when expressed with retinal in Escherichia coli.  Note
        that additional three nucleotide residues incorporated by pcr pri
        ming with reference to the original 31A08 DNA sequence (DNA resid
```
—————⟶   ues 4-6, ggt), adding a new restriction site for cloning

FYI: Per 1.823 of Sequence Rules, the <223> response
for a MAXIMUM of 4 lines.

VERIFICATION SUMMARY   DATE: 05/16/2001
PATENT APPLICATION: US/09/847,513   TIME: 13:37:03

Input Set : A:\MBA10101.txt
Output Set: N:\CRF3\05162001\I847513.raw

```
:11 M:270 C: Current Application Number differs, Replaced Current Application No
:11 M:271 C: Current Filing Date differs, Replaced Current Filing Date
:24 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:1
:134 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:1
:3559 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:2
:3572 M:286 W: Invalid Database Entry: Valid Formats YYYY-MM-DD or Mon-YYYY, SEQ ID:2
:3584 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:3
:3597 M:286 W: Invalid Database Entry: Valid Formats YYYY-MM-DD or Mon-YYYY, SEQ ID:3
:3615 M:259 W: Allowed number of lines exceeded, <223> Other Information:
:3790 M:286 W: Invalid Database Entry: Valid Formats YYYY-MM-DD or Mon-YYYY, SEQ ID:6
```